

Defining the Technological Research University of the 21st Century

State of the Institute Address to Students

G. Wayne Clough, President, October, 2000

(TITLE SLIDE)

Good morning. It is my pleasure to present the year 2000 State of the Institute Address. In my remarks I will provide you with a summary of an impressive year of accomplishments and share with you ideas about what needs to be done if we are to capture the great potential that exists for this institution.

Someone coined the term “Harvard-ization” to describe the goal of many American colleges and universities. If this is your goal, you pick out the best university you know, and do your best to imitate it. Over the course of the 20th century, Georgia Tech was guilty of its share of “Harvard-ization.” We added the requisite graduate programs and developed a solid research agenda, and in the process we advanced from a very good regional school to one with a national presence. Yet the path we trod through the 20th century was largely blazed before us by the likes of MIT and Harvard.

However, in the past decade we have begun to develop an agenda of our own making that has others looking to us for future directions. Indeed over the course of the last six years, few if any universities have won three National Science Foundation Centers of Excellence; been awarded the nation’s top teaching recognition, the Hesburgh Award; and been designated a site for a European Union Center. These are impressive signs of progress, but if we are to truly establish our place as one of the world’s best, we have to help define the future, not emulate the past.

In my State of the Institute Address last year, I expressed my confidence that as the 20th century drew to a close, Georgia Tech was poised on the threshold of a new era. We are now entering the 21st century, and we want to make it our century – a time when our collective effort lifts Georgia Tech from the ranks of the good, solid schools, and establishes us as a center and source of innovation. This is a challenge worthy of us, and it will take effort, time, persistence, and careful investment to meet it.

Over the past year, the students, faculty, staff, and alumni of this great institution have moved us forward into position to strive for the goal of the new century. This year, as in the past, there are many accomplishments to celebrate at Georgia Tech, and I am not able to do justice to them in a single address. To help appreciate what goes on at a dynamic place like this, we have collected some of the highlights in a brochure, which we invite you to take with you.

(SLIDE: FRESHMEN DATA)

As you can see, the quality of the students who choose Georgia Tech continues to rise, and it comes on the heels of an increase in applications of 25 percent over a brief two-year period. When I returned to campus in 1994, I was impressed with the quality of the students Georgia Tech was attracting then, and they just keep improving. This fall we have also experienced a remarkable increase in the percentage of students who returned for a second year on campus. One year doesn't make a trend, but this is a very positive indicator that moves in a direction we need and want to go. And I'll have more to say about that in a few minutes. We even have more sets of twins in this year's freshman class, up to eight from six last year.

(SLIDE: GTREP)

We are seeing increasing demand for our services not only on our Atlanta campus, but also for the Georgia Tech Regional Engineering Program, known as GTREP. One year into its existence, GTREP already has nearly 200 students on track to earn Tech engineering degrees without leaving southeast Georgia. A recent \$10 million donation of land will allow us to develop a first-class campus in Savannah. This program owes its success to the hard work of Dr. David Frost, our GTREP Director; our Dean of Engineering, Dr. Jean-Lou Chameau; and our university partners, Georgia Southern University in Statesboro and Savannah State and Armstrong Atlantic State Universities. GTREP already has nine Georgia Tech faculty based in southeast Georgia, and we plan to hire seven more this coming year.

(SLIDE: ATHLETICS)

On the playing fields our student athletes excelled. This past year three of our outstanding student athletes stood among the best in the nation or even the world in their specialties, while four were named Academic All Americans. Even more significant, 38 percent of Georgia Tech's student athletes were on the dean's list last spring.

We are also proud of Ralph Friedgen, the architect of the nation's top offense, who was recognized as the most outstanding assistant football coach in the nation. Finally we salute the performance of former student Angelo Taylor, who won two gold medals in the Olympics in Australia in the 400 meter hurdles and the 1600 meter relay, maintaining Georgia Tech's hold on these two golds, which Tech alums Derrick Akins and Derek Mills won in the Atlanta Olympics.

(SLIDE: FACULTY PHOTOS)

Our faculty continue to do their part to make Georgia Tech a stellar institution. Last year, ten young faculty earned CAREER Awards from the National Science Foundation,

and Tech faculty have now earned a total of 46 CAREER awards, the third highest in the nation. Two more Tech professors were elected to the National Academy of Engineering, bringing our total there to 19, including Dr. Richard Lipton, who brought his expertise in the emerging new field of bioinformatics to Tech.

(SLIDE: ENDANGERED)

It was a great year for Georgia Tech's research labs as well, and these are just two examples of a wide variety of creative projects that Tech researchers engaged in. Research expenditures reached an all-time high of about \$274 million, marking the sixth consecutive year of growth, and 175 invention disclosures were filed, another all-time high.

(SLIDE: BUILDING LIST)

We have a Campus Master Plan aimed at providing an appropriate setting for one of the world's pre-eminent technological research universities. The Master Plan outlines many improvements all across campus, shaping our facilities for a new level of excellence in the new century. Our complex for bioengineering and biosciences, environmental technology, and molecular sciences recently drew praise in the magazine *Nature* for its innovative approach to creating a place for leading-edge interdisciplinary research and learning.

The Master Plan also addresses another important facility issue – parking. As this list indicates, the State Street Deck is under construction, and will provide 850 new parking spaces when it opens next spring. The SAC expansion and the Fifth Street Project also include parking decks that together will add more than 2,000 new parking spaces. Both of these projects should be underway within the next year. So take my word for it, parking is going to get better.

(SLIDE: 5th ST)

Our Campus Master Plan calls for us to work in partnership with our surrounding neighborhoods to create a complete urban community that offers all of the ingredients for quality of life. That is our goal as we plan to take a historic step across the Interstate barrier and become an active participant in Midtown.

Georgia Tech's Fifth Street Project is an ambitious \$150 million undertaking that will develop the south side of Fifth Street between the Downtown Connector and the Biltmore Hotel. Two-thirds of the cost will be covered by the revenues the facilities generate. The remaining third will come from private donations. We are working hard and have already raised \$15 million from generous donors who share the possibilities of this vision with us.

This complex will house many of our programs that are most directly connected to the Atlanta community, placing them close to those they are designed to serve. This location is especially important for the DuPree College of Management as it develops closer relationships with Atlanta's high-tech community, and for the continuing and executive education programs that serve Tech alumni and Georgia's businesses and industries.

At the same as we are building the Fifth Street Project on the south side of the street, the new Yamacraw Broadband Design Center will be going up on the north side. Yamacraw is the state's strategic initiative to make Georgia a world leader in the design of broadband systems, devices, and chips. Georgia Tech is the lead university in the Yamacraw initiative, and it has allowed us to add 22 faculty to the College of Computing and the School of Electrical and Computer Engineering.

(SLIDE: CAMPAIGN)

Of course, we could not attain the accomplishments I have described without ample resources, and the Georgia Tech Foundation and the Campaign for Georgia Tech have been great benefactors for our aspirations. The campaign began almost five years ago with a goal of \$300 million. That goal has been raised several times along the way – most recently to \$600 million just last spring. And we will have exceeded it by the time the campaign ends on December 31st.

The campaign has been a broad effort, with campus-wide participation, and activities taking place in dozens of cities in the U.S. and well as at least three foreign countries. Campaign gifts have made a significant difference in our facilities and for our faculty and students, and we are looking forward to celebrating its successful conclusion with follow-up events next year here on campus and in a number of cities around the nation.

But the end of the campaign does not mean that we fold our tents and go back to where we were before it started. Even as we prepare to celebrate its success, we are making plans to sustain the higher level we achieved during the campaign, to revisit our priorities for the future, and to ensure that our stewardship efforts cultivate the many new friends we have made.

(SLIDE: RANKINGS)

All of the accomplishments I have cited have attracted public recognition. In September's *U.S. News & World Report* undergraduate rankings, Georgia Tech jumped from 10th place to 8th among public national universities, and the DuPree College of Management moved into the top tier of *Business Week's* annual ranking of business schools. You have to take these rankings with a grain of salt, but the trend for Georgia

Tech is clearly positive and it helps establish our image as an institution on the fast track.

Under the category “when you are hot you are hot,” we would be remiss if I failed to mention one of Georgia Tech’s most interesting number one national rankings of the year.

(SLIDE: BUZZ)

On our campus we have known all along that Buzz is the best mascot in the land, but now the secret is out, and the nation has confirmed it. Buzz is number one!

(TRANSITION SLIDE)

These are just a few of the accomplishments of the past year that give us cause to celebrate. But our goal is to be more than simply the result of the past. If we are to be the institution that defines the technological university of the 21st century, we need to take the initiative to address the issues that lie between us and our goal. This task goes beyond the basic need to continue growing the distinction of our faculty, recruiting the best undergraduate and graduate students, and providing the facilities for the future. So I want to use the remainder of my remarks to focus on challenges we must recognize and meet if we are to reach our goals for this institution in the 21st century. These relate to undergraduate education, diversity, and campus entrepreneurship.

(SLIDE: UNDERGRAD)

Our undergraduate student population stands at 10,744 and represents 73 percent of our total enrollment. To a large extent the early development of Georgia Tech was based on undergraduate education, but in the past three decades the Institute has seen its fortunes rise because of the growth of its research enterprise. During this time our graduate programs expanded at a headlong pace, improved in quality, and opened exciting new opportunities for advanced study. At the same time our undergraduate student body also grew, both in quantity and quality, and today it is arguably one of the best qualified at any public institution in the nation. However, our undergraduates do not express the same high level of satisfaction with their educational experience that our graduate students do. Their dissatisfaction is tangibly reflected in the *U.S. News & World Report* rankings, where Georgia Tech is cited overall as among the nation’s best, but we are solidly in the second tier at 71st place for undergraduate student retention and graduation rates. Fully one-third of the undergraduates who matriculate at Georgia Tech do not graduate despite having entered with the qualifications to do so. This consequence sets us apart from those institutions with which we strive to compete in research and reputation. For example, MIT, Stanford, and the University of Virginia all graduate more than 90 percent of their undergraduate students.

(SLIDE: STUDENT COLLAGE)

To better understand our circumstances, we participated in the National Survey of Student Engagement last year. While some of the results were encouraging, our undergraduate students told us they had too little contact with our faculty outside the classroom. Importantly our scores for undergraduate student engagement in research were well below the national average. The survey was official confirmation of what the typical undergraduate student at Georgia Tech will tell you if you ask – that research is perceived as one of the reasons faculty are not available to them. In other words, as we have developed our research prowess, we have not made the necessary effort to bring our undergraduates into this critical part of our life as an institution.

(SLIDE: QUOTE)

An additional telling point for me came recently in a conversation with several undergraduate students about the effect of our capital campaign on them and Georgia Tech. When told that 40-plus chairs had been created for faculty, the students said fine, but they had no expectation of seeing any of these distinguished faculty in the undergraduate classroom or as an advisor for an undergraduate research experience. While many of our senior faculty do indeed participate in undergraduate education, the perception of our undergraduates indicates that a problem exists.

The data on retention and lack of engagement of our undergraduate students in research and with senior faculty suggest that as an institution we are not yet a research university in the best sense of the term.

(SLIDE: STUDENT ARCHWAY)

As we face the need to collectively address these issues, the common ground lies in our belief in the concept of the university and the framework underlying it. We begin with the need for all of us – students, faculty, and staff – to understand that a superlative undergraduate experience is a significant and integral part of a world-class research university. And we all share the responsibility for creating that environment at Georgia Tech. We should appreciate that research and undergraduate education are not mutually exclusive components that compete with each other, but can, and ought to be, integrated to enrich each other. Research is a learning process, and our goal is to be a community of scholars that joins together in discovering and sharing knowledge.

(SLIDE: KUDZU KID)

We already have the raw materials to create an exceptional undergraduate experience. Our undergraduates are coming to us today with research skills and interests, honed through sophisticated award-winning science fair projects. We need to make sure these

outstanding young people get their fair share of the dynamic energy generated by our world-class research enterprise.

(SLIDE: SGA GROUP)

To this end, I am announcing an initiative to enhance the undergraduate teaching and learning environment, which is designed to provide our colleges and schools and their faculty and staff with incentives and resources to do the job. I am pleased to say that the ideas for this initiative reflect a consensus from deliberations in various forums like our Faculty Executive Board and Faculty Senate, with our Deans and Chairs, and most recently through the recommendations of the Joint Commission on Enhancing Undergraduate Learning – a group of 12 faculty, 12 staff and 12 students brought together by our Student Government who have issued a very thoughtful proposal that deserves our attention.

(SLIDE: LIST)

The new initiative will consist of four parts:

1. (*KEY STROKE*) I will create a fund of \$250,000 to support faculty in their efforts to engage more undergraduates in research projects. Faculty will be invited to submit proposals that create opportunities for undergraduates to participate in meaningful research activities.
2. (*KEY STROKE*) One of my personal goals is that all academic faculty, including endowed chair holders and Regents professors, will be directly engaged in the undergraduate experience in some way. I will charge the Colleges and Schools to provide recognition for efforts undertaken in support of our undergraduate agenda. I also intend to create an oversight committee composed of faculty and administrators to evaluate our core curriculum for instruction and content. We ask faculty from different schools and colleges to teach subjects as specialists in a sequence whose sum is expected to add up to a whole. We need to look at our efforts from a broader view and make sure those pieces are fitting together.
3. (*KEY STROKE*) We want graduate students and undergraduate leaders to become mentors and advisors who enrich the process of undergraduate learning. It is my goal to budget for an additional 10 graduate teaching assistants and 10 undergraduate teaching assistants each year for the next three years, adding a total of 30 in each category. The SGA's Joint Commission on Enhancing Undergraduate Learning highlighted the need to better prepare our teaching assistants for their important role. And we will also provide resources to expand our training programs for TAs.
4. (*KEY STROKE*) Finally, we are going to document, reinforce, and share best practices in undergraduate advising, teaching, and research across our academic

units. There is no need for each professor or academic unit to reinvent the wheel in isolation when we all can learn from each other.

(SLIDE: FOUNDATION)

Let's begin by appreciating the foundation we have on which to build. Vice Provost for Undergraduate Studies Bob McMath has been working on these issues for more than a year, talking with students, faculty, and academic and administrative leaders, gathering information on who is trying what remedies. He found that the majority of our faculty have a genuine concern for our undergraduates. They worked hard to develop an innovative, technology-based curriculum when we required all students to have computers. And just last year the Hesburgh Award recognized these efforts and those of our Center for the Enhancement of Teaching and Learning as examples for others to emulate.

The benefit of such efforts was clear in the National Survey of Student Engagement. Compared to other research universities, Tech students use more technology. They are given a higher level of open-ended problems and essays on exams. We have a stronger focus on synthesizing and organizing ideas, and applying theories and concepts to practical problems or new situations.

(SLIDE: AEROSPACE)

Based on a recent survey, more than 100 professors are already involving undergraduates in research experiences, and they provide some excellent examples for us to draw on. Student research teams in aerospace engineering were chosen by NASA to carry out experiments they designed to be conducted under reduced gravity. GTRI researcher Rob Michelson initiated in the International Aerial Robotics Competition, in which Georgia Tech student teams design, build and operate autonomous, intelligent flying machines.

(SLIDE: CHAMEIDES/McMATH)

We also have good role models among high-level professors and administrators, some of whom already devote time to teaching undergraduates. In addition to being the lead researcher on several international air quality studies, Smithgall Chair holder and Regents Professor of Earth and Atmospheric Sciences Bill Chameides also confesses that he enjoys making his students laugh. Vice Provost for Undergraduate Studies Bob McMath keeps his hand in the classroom as well, teaching southern history in the Ivan Allen College.

(SLIDE: CETL TRAINING)

The Center for the Enhancement of Teaching and Learning has already developed outstanding teaching fellows programs for young faculty and teaching assistants, which were recognized last year with the Hesburgh Award. We will provide additional resources to enable CETL to expand these efforts with a focus on TAs.

(SLIDE: GRIFFITH)

The School of Literature, Communication and Culture in the Ivan Allen College recognized that small classes and detailed feedback are essential to the process of helping freshmen learn to write, and came up with an innovative solution to reduce class size. The Marion L. Brittain Teaching Fellows are post-doctoral students who come to Georgia Tech from around the nation for the unique experience of teaching literature and composition in a technologically sophisticated learning environment.

The goal of this undergraduate initiative is to encourage, share, and expand positive efforts like these among our faculty and academic units.

(SLIDE: ME HANDBOOK)

But there are two sides to every coin, and students also have responsibilities to fulfill if we are to create a superlative undergraduate experience. Woody Allen once said that 80 percent of success is showing up, and when it comes to attending class, that is true. As students, you will get out of class what you put into it, and it is reasonable for faculty to expect you to show up with completed assignments in hand and prepared to participate in class. If you neglect your responsibilities to the educational process by not showing up for class or not participating when you're present, this also diminishes the educational experience.

(SLIDE: TUTORING)

It is also your responsibility to seek help if you find yourself falling behind. You are all very bright or you would not be here, but Georgia Tech is a rigorous place. We understand that excellence is never achieved by lowering standards, and our goal is the same as a good track coach – to provide the support and coaching you need to continue to clear the bar even as we continue to raise it.

Taken together the components of the initiative I have described should allow us to take a large step toward creating a more positive and exciting environment for undergraduate teaching and learning. Our provost and Dr. McMath will lead the effort, and I look forward to working with them to see to its success.

(SLIDE: DIVERSITY)

Another related area where we hope to improve our life together on this campus, and to make needed progress, is by creating a campus where diversity is valued and welcomed for all of its potential benefits.

(SLIDE: QUOTE)

In a global environment that thrives on innovation, diversity is a competitive advantage, because it provides a broader, richer more fertile environment for creative thinking and problem solving. As a result, competition is stiff for high-quality, diverse talent, whether students, faculty or staff.

(SLIDE: STUDENT %)

We have made significant progress in diversifying our faculty and student body at Georgia Tech since the days when both were exclusively white males. But the percentage of our students who are women has remained relatively static. And while we rank first or second in the nation in graduating African American engineers, the hard numbers it takes to achieve that distinction are pretty small, and we need to do better there as well.

(SLIDE: WRC, OMED)

We need to be creative and flexible in recruiting minorities and women, both as students and faculty. But one of the best ways to attract talent is to create a campus environment where everyone feels welcome and at home. If we become known as a place that values diversity in our daily life as a community, then recruiting will become an easier task.

(SLIDE: STUDENTS)

We also have to understand that while we often cite our success stories, diversity remains highly uneven at Tech, as was pointed out in our recent Federal Diversity Audit. To help us broaden our efforts we are developing an Institute-wide approach. First, we have created the Institute Diversity Management Group made of Tech's highest-ranking officials, which I will chair. Operating under the umbrella will be two organizations that will help us value and attract diversity.

(SLIDE: PEARL A)

The Council on Diversity, chaired by Pearl Alexander, will help us improve our recruiting process, and share best practices in diversity management among the many units that make up this campus.

The Diversity Forum, chaired jointly by a student who is in the process of being named, and Charles Brown of GTRI, will provide opportunities for the campus community to engage in open, respectful discussion of issues surrounding diversity. This group will help us appreciate that diversity is more than a headcount of the different types of people on this campus, but rather also relates to a willingness to understand and appreciate differences in opinions and ideas. A Diversity Town Hall meeting is scheduled for November 15, and I encourage you all to participate. The discussion will address the Georgia state flag controversy.

(SLIDE: RESEARCH)

Anyone who aspires to define the technological university of the 21st century must be on the leading edge, and this includes not just creating new ideas but also moving them from the laboratory to a place where they can be used by society. The institutions that do technology transfer well and support faculty efforts to move in this direction, contribute to society in ways that improve economic conditions for all.

(SLIDE: FACULTY START-UPS)

But taking innovations to market is a challenge. So we celebrate the success stories like the ones shown here. We have the advantage of the Advanced Technology Development Center, which was the nation's first university-based incubator when it was created 20 years ago. And today it provides a helping hand to guide faculty through the process of organizing a company and hardening their idea or discovery into a reliable, marketable product.

(SLIDE: EMTECH BIO)

ATDC's newest project is the incubator at EmTech Bio, a commercial research and development center for biotechnology operated jointly by Georgia Tech and Emory University. Its mission is to spark development of high-tech biotechnology industry for Atlanta's and Georgia's economy.

We recently visited five campuses where technology transfer is done well, and used the information to develop a roadmap to define clearer, more structured policies and pathways for faculty to take their innovations to market. In the coming year we will be implementing this plan.

We will also be looking for ways to provide guidance for students who have developed innovations that have market potential and are seeking to become entrepreneurs. Chris Klaus, for example, started Internet Security Systems in his dorm room as a Tech student, and at the age of 26 donated \$15 million to Georgia Tech for the Advanced Computing Technology Building, which will be named for him. Chris dropped out of

school and moved home to develop his company. We want the next Chris Klaus to be able to stay at Tech and get assistance and guidance for starting a company through ATDC.

(SLIDE: QUOTE)

And that, ladies and gentlemen, concludes my year 2000 State of the Institute Address. I know we all share in the pride not only in these many individual accomplishments, but also the way those achievements come together to place this Institute in a position that will help us define the technological university of the future. This is a goal worthy of an institution with our vision and aspirations. We have hard work ahead of us to achieve it, but with your help we can succeed.

(CLOSING SLIDE)